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Business model for cross-border interconnections in the Mediterranean basin

Executive Summary

Rahmatallah Poudineh & Alessandro Rubino*

The existing Mediterranean energy infrastructure was mostly designed and built more than 50 years ago and were based on the national-level energy policies and security of supply priorities of the time. Since then, the energy landscape has changed dramatically. Now, national dynamics must be harmonized with regional and global developments and policies. In particular climate change policies and energy security measures have greatly impacted the existing energy infrastructures and transmission grids, and are expected to continue doing so in the foreseeable future. In order to achieve the national and regional energy policy objectives, the infrastructural endowment will need to be updated in most countries of the region.

Projected GDP growth, demographic trend as well as rapid urbanization have an immediate effect on the supply and demand for electricity services. They elevate pressure on the existing infrastructure and increase the necessity of new investments. The World Bank in 2010 estimated that the region needs investments in excess of €27 billion a year (US\$ 30 billion) up to 2040. This number represents about 3% of the region's total projected GDP, and implies a rate of investment three times higher than the rest of the world. This staggering amount is required, according to the World Bank, to deal with a number of key issues that, at present, reduce the attractiveness of the energy sector in the region. In addition, the increased generation fleet and the significant penetration of RES generation, on both sides of the basin, requires not only the strengthening and integration of the Southern Mediterranean networks but also their integration with the Northern ones. The association of the Mediterranean TSOs (MED-TSO) is expecting the construction of an additional 33000 km of high voltage lines and at least 3000 MW of North-South Interconnections. MED-TSO estimated the investment required, for the additional transport capacity, to be in the order of €20 billion by 2020 (Med-TSO, 2013).

Therefore, for the electricity grid, a combination of short-term goals and long-term patterns will guide development of the transmission network in the coming decades. Reinforced interconnection between Member States (MS) in the EU and South and East Mediterranean Countries (SEMCs) are required in order to achieve more secure and more sustainable energy systems. In this framework regulated cross-border interconnections, that constitute the default option and the main business model for interconnections in the EU region has proven to be unable to unlock investment. To overcome the lack of investment, the insight from the economic theory according to which competition "for the market" can be a valid substitute when competition "in the market" is not feasible generated interest in a new business model known as Merchant Transmission Initiative (MTI). Under this model, private investors enter the market with the incentive that they will be exempted (fully or partially) from the regulatory restrictions which prevail under the regulated model. Nonetheless, the MTI model is considered an exception to the EU laws, and private investors still face various other challenges investing in interconnection in a heterogeneous region.



In the Mediterranean region, it is now clear that institutional diversity and the existing legal and regulatory framework play a fundamental role in explaining the scarce volumes of energy exchange between countries, vis a vis price differential. Notwithstanding recent progress towards global economic and financial integration, national borders in the Mediterranean area still show a significant and depressing effect on energy trade. This is even more evident in the south–south route when we look at electricity trade. Physical connections are already in place but the rate of utilization of the existing capacity is extremely low. North–south interconnection is even more limited, consisting of just the Spain–Morocco interconnection.

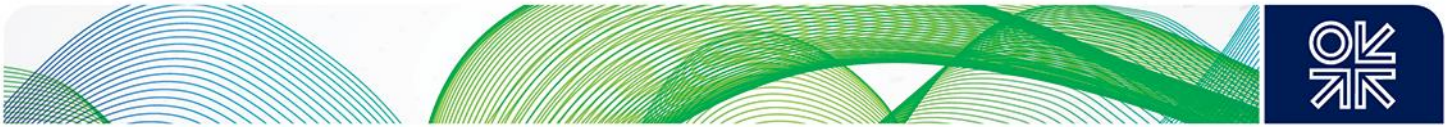
Therefore, whereas regulated cross-border transmission lines are envisaged as the default option, private (non-regulated) actors might be needed to play a significant and probably more fundamental role, on both side of the Mediterranean basin. Our review shows that the existing cross-border interconnections in SEMCs are based on regulated business models. Moreover, the 16 currently planned ICs are also foreseen as regulated lines. In addition, according to Association of the Mediterranean Energy Regulators (MedReg), of the new proposed cross-border lines, only the Egypt–Saudi Arabia link is at an advanced state of planning. The remaining projects are at preliminary stages (feasibility or earlier stages) and have an uncertain degree of viability when project financing is taken into consideration. It appears that the existing business models are unable to provide efficient economic signals to spur investments.

The demographic and macroeconomics challenges that most countries in the region are facing and the necessity to achieve national and regional energy policy objectives require that the cross-border interconnections in the Euro-MENA region need to be considerably enhanced. Although the disparities among the NMECs and SEMCs countries in terms of the stage of market development, regulations and energy priorities make the development of transport capacity challenging, both sides of the basin would benefit from more interconnected electricity systems. The SEMCs can meet their increasing electricity demand and improve their security of electricity supply, while NMCs can promote the sustainability and efficiency of their electricity systems.

Given the problems with regulated investment models and the challenges of implementing a pure MTI, we advocate a hybrid business model in which the main benefits of a merchant model are maintained within a regulated structure. Additionally, when choosing a business model, policy makers often face a trade-off between achieving a cost effective quantifiable impact that is typically associated with minimal regulatory changes, with a long term paradigmatic modification of the system dynamics. Our hybrid model is able to accommodate these two instances based on the following characteristics:

- It is initially developed to accommodate the growing electricity demand in North Africa by exporting excess capacity from Europe,
- It is not based on RES trade, but is compatible with any development of the electricity mix. In particular, it doesn't depend on the implementation of additional regulatory provision regarding the interpretation of article 9 of the directive 2009/28/EC.
- It will only address issues related to security of electricity supply and doesn't require or impose any structural change in the regulations of the domestic markets.

The proposed hybrid model is an alternative regulated investment scheme which intends to combine the contained risk of a regulated project with the less restrictive regulation of revenues of a merchant project. Contrary to the traditional regulated model where revenues and losses are predetermined by the national regulatory authority (NRA), in our model the NRAs determine a range for rate of return within which the implicit long-term contract between the generators and the importing TSO can be carried out. The application of a cap and floor model for interconnection is not new as, for example, the UK uses a similar approach to regulate interconnectors. However, our proposed model differs from the UK model in various aspects such as the ownership of asset, distribution of risks and trade direction among others. In this sense it is more a “flexible regulated model” rather than a merchant model.



Since the IC is projected to inject the excess capacity available in the EU into the importing network, this investment needs to be underwritten by a long-term supply contract, subject to periodic revisions, that will also include some form of take or pay clause. This is to share the risks between the counterparts in an efficient manner. In this construct, the buyer will take the volume risk, and the seller bears the price risk. In this way, consumers are protected from the cost implications of excessive returns or market power that might accrue to interconnector owners; developers are able to earn returns that are commensurate with the levels of risk to which they are exposed under the regulatory framework; and the regulatory treatment of developers are coordinated between the TSOs at either end of the shared asset, and approved by the NRA in Europe.

The cap and floor in the hybrid model is defined by the regulator of the exporting country ex-ante, and approved by MedReg. The IC capacity allocation will be fixed for a long term period (e.g., 15 years) but indexed to a measure of the cost of the marginal plant providing the generation exported (using a cost-based approach).

The proposed model is compatible with any development of the regions' electricity mix in the future, especially the eventual export of renewable power from north Africa to Europe and can be implemented with minimum requirement of change in the regulations of the domestic markets. Therefore, it is perfectly compatible with the region's governance structures and risk attitude.

*Rahmatallah Poudineh, *Lead research fellow, Oxford Institute for Energy Studies, Oxford, UK*
Alessandro Rubino, *University of Bari*